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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/574,113

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Joung-Hyeon Lim

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EXAMINER

HECKERT, JASON MARK

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/574,113	<b>Applicant(s)</b> LIM ET AL.	
	<b>Examiner</b> JASON HECKERT	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 34-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/24/08, 8/14/06</u> .                                       | 6) <input type="checkbox"/> Other: ____.                          |

***Election/Restrictions***

1. Claims 34-40 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 12/17/09.

2. It appears as if multiple unique species are present in the apparatus claims (a valve, a loader, a guide mechanism, and the transfer boat features). Due to the fact that one restriction was already furnished to the applicant, these claims will be examined on the merits. However, it would be preferred if the applicant could focus amendments on the allowable nature of the linking claim (claim 9) in order to prevent a future burden on the examiner's searches. If the applicant would like to discuss these matters in order to hasten prosecution, the examiner is available for interview.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4, 5, 9-32 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 4 claims "the drying process", however said limitation lacks antecedent basis. Please revise.

6. Claim 5 is unclear. It is not understood what a "cassette sojourns" is. Please revise.

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7. Claim 9 claims "the air", however said limitation lacks antecedent basis.

Please revise.

8. Claim 19 is rejected for being indefinite. It is not clear how solution falling from the outer side wall can be guided back into the transfer bath, if the guide plate is below the transfer bath. Without a positive recitation of the structures that dictate this ability, such a claim is impossible to examine on the merits, as it doesn't function intuitively.

9. Claim 21 rejected for being indefinite. It is not clear what is meant by "when the cleaning solution is filled". The claim includes conditional language, however the conditions have not been defined previously, thus it is impossible to determine when and where such conditions occur. Please revise said claim distinctly claiming the invention. As claimed, said claim is impossible to examiner on the merits because it is not clear where said devices are due to the ambiguity of the limitations.

10. Claim 32 is not intuitive and is considered to be indefinite. The loading/unloading area contains the alignment part, and the alignment part is taught to convert the substrate between vertical and horizontal positions. It is not clear how the substrates are cleaned on the aligner part, or what is meant by the loop shape of the aligning part. Please revise said claim, clearly claiming the structures of the invention. Furthermore, this claims is intended use.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-2, 5, 8 rejected under 35 U.S.C. 102(b) as being anticipated by Kaneda (JP 06-163505). Kaneda discloses a wafer cleaning facility having a multi-storied structure. Each story comprises a process chamber. Inside each chamber is a cleaning bath 2. Items 7 and 8 comprise transfer robots and can be considered to be located within an interface part. Each of the process baths are configured to at least clean or rinse the wafer. While chemical treating and drying are not required by the claims, examiner finds such processes to be conventional in the substrate art, as mentioned in the disclosure of the background art. Wafer carrier 5 reads on a cassette and is disposed at the respective process chambers (see figure).

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 3-4 rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneda in view of Yamamoto (JP 2000-183019). Kaneda discloses cleaning baths located within stacked process chambers, but does not disclose having

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multiple baths within each chamber. However, the applicant admits in the specification that the previously known method of cleaning involved multiple baths at the same level. Yamamoto discloses such an arrangement (abstract). Multiple processing baths are located next to one another for sequential wet treatment, and drying devices are stack on top. It would have been obvious to one of ordinary skill at the time of invention to stack wet treatment chambers, as taught by Kaneda, in order to conserve space, and further include multiple baths, as taught by Yamamoto, for sequential processing.

14. In regards to claim 4, both Kaneda and Yamamoto teach transfer robots. Kaneda additionally teaches multiple wafer transfer mechanisms, such as the cassette and the elevator. Including multiple transfer robots is not considered to be a patentably distinct feature, as it is a mere duplication of previously known parts. Rearrangement of parts was held to have been obvious. *In re Japikse* 86 USPQ 70 (CCPA 1955). Such a modification is well within the skill of one practicing the art, as the devices continue to perform their known function, carrying substrates.

15. Claim 6-7 rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneda in view of Yamamoto and further in view of Inagaki and Matsumoto. While the examiner believes that Kaneda and Yamamoto incorporate some method of exhaust, Inagaki is presented as a clear teaching of providing a filter 116 along with an air input in order to provide gas flow into the chamber. Said flow is exhausted through duct 117. Such features are very common in the substrate processing art. In regards to exhaust located on the transport part,

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Matsumoto teaches including an air-blower mechanism 44 for applying clean air or temperature controlled air during transferring (paragraph 51). Air blowing device conventionally include a source of energy (a fan, blower, etc) and a duct for the air to move through on its way to its destination. Thus, the exhaust pipe and exhaust fan are considered to be inherent. The claimed damper is nothing more than a common valve, a conventional apparatus for regulating fluid flow. Said features are well established in the art and provide predictable results to one of ordinary skill. Their mere inclusion is not considered to be a point of novelty, let alone patentably distinct. It would have been obvious at the time of invention to modify Kaneda in view of Yamamoto, as stated above, and further include exhaust means, as taught by Inagaki and Matsumoto, in order to prevent contamination from dust particles.

16. Claims 9-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneda in view of Nishiwaki (JP 2000-26080). Kaneda discloses an interface part where substrates can be transported, but does not disclose a transfer bath. However, vertically moving transport tanks are known in the art of cleaning substrates. Nishiwaki discloses a vertically moving tank 22. The tank includes a nozzle 27 that supplies water to the tank. The fluid nozzle is inherently connected to a fluid supply. The tank has an open top, thus the nozzle must be on a lateral face or the bottom. Moreover, it is described as being located to push foams over an edge, so it is likely on a lateral face. The cleaning solution is water. Deionized water is a common cleaning solution in the substrate processing art for its low level of ions and electrical inactivity. The nozzle is used

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when the substrates are in the bath, thus effectively performing the applicant's rinsing process. Kaneda and Nishiwaki both disclose movement means for their transport devices, comprising frames, slider on a rail, and a driving part. See Kaneda's device 5 and the abstract of Nishiwaki. Nishiwaki further teaches a discharging fluid tank 28 that reads on the applicant's outer bath, as it surrounds the cleaning tank. It would have been obvious at the time of invention to modify Kaneda's device, and include a transfer bath, as taught by Nishiwaki, in order to transfer the substrates.

17. Claims 23-25 rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneda in view of Nishiwaki and further in view of Lenzing or Creissel. Nishiwaki is silent to the inclusion of a valve, however one of ordinary skill would see the need and find it obvious to include means to exhaust the fluid inside the transfer bath, as it can become dirty, stagnate, and require fresh solution. Lenzing teaches a valve with a body, plate 42, spring 23, rod 28, that appears to function as the instant applications spring valve. Creissel discloses a spring valve with a spring, plate, locking element (readable on the switching element), and rod 10 (see claim 1). When both of these valves are separated fluid can move through the valve body. It would have been obvious at the time of invention to modify Kaneda in view of Nishiwaki and further provide an exhaust valve, which is conventional. One of ordinary skill would look to common exhaust valves such as Lenzing and Creissel in order to provide selective flow.

18. Claims 27-33 rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneda in view of Nishiwaki and further in view of Tashiro et al (US



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2004/0018745). Kaneda and Nishiwaki do not disclose alignment and position of the substrate for processing. Tashiro teaches the use of positional relationships for various aspects of substrate processing. The transfer mechanism 44 moves the substrates. There is an input/output chamber which contains an alignment device or orientor 56. Item 50 reads on the stocker and mechanism for transferring a cassette or substrates. The pusher is appears to be nothing more than a common release mechanism for allowing ejection of the substrate from the holding mechanism. From the teachings of Tashiro, one of ordinary skill understands that the substrates must be aligned when delivered to any area of the apparatus, whether it be from a cassette to a cleaning station, or a cleaning station to a drying station, etc. Additionally, if the substrates are inputted vertically, and need to be placed horizontally, a common substrate robot or transfer mechanism is capable of rotating on its axis for placement. What is important is that the substrates be aligned, and Tashiro provides a sufficient teaching and method of performing an alignment function. Absent a showing of unexpected results, routine changes in alignment are considered to be obvious variants. It would have been obvious at the time of invention to modify Kaneda in view of Nishiwaki, and further include a loading device with alignment functionality, as disclosed by Tashiro, in order to align substrates in the processing of Kaneda are arranged in a vertical row.

19. Claim 26 has not been rejected under a prior art rejection, but has been rejected under a 112 rejection for indefiniteness. If the applicant can successfully overcome the indefiniteness, and combine claim 26 along with the claims from

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which it stems into an independent claim, such a claim would be allowable. The prior art does not teach supplying drying gas to a fluid exhaust valve.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON HECKERT whose telephone number is (571)272-2702. The examiner can normally be reached on Mon. to Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571)272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael Barr/  
Supervisory Patent Examiner, Art

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JMH